

Application Serial No. 10/802,439
Amendment dated December 8, 2005
Reply to Office Action dated September 8, 2005

REMARKS/ARGUMENTS

Applicants have received and carefully reviewed the Office Action of the Examiner mailed September 8, 2005. Claims 1-34 remain pending, with claims 33-34 being newly presented. The amendments to the claims are believed to be fully supported by the originally specification as filed. Reconsideration and reexamination are respectfully requested.

Information Disclosure Statement

On page 10 of the Office Action, the Examiner indicates that the Bucher Johannes reference (US 2002/170786 A1) cited by the Applicant in the August 16, 2005 IDS was not considered because it could not be found. Another copy of the Bucher Johannes reference is enclosed herewith for the Examiner's reference. Applicant respectfully requests that the Examiner consider the Bucher Johannes reference and provide Applicant with an initialed FORM-1449 in due course.

Rejections under 35 U.S.C. § 102(b)

In paragraph 2 of the Office Action, the Examiner rejected claims 1-3, 8-9 and 14-17 under 35 U.S.C. §102(b) as anticipated by Hajny et al. (U.S. Patent No. 5,295,562). Although Applicant respectfully disagrees with this rejection, claim 1 has been amended to recite:

1. (Currently Amended) An actuator configured to actuate a water valve having a valve with a valve stem, the water valve adapted to be coupled to a fluid system, the actuator assembly comprising:
 - a motor configured to drive the valve stem in a first opening direction;
 - a biasing mechanism for driving the valve stem a second closing direction that is opposite to the first opening direction, wherein the biasing mechanism is adapted to close the valve stem within a time period that would cause water hammer in the fluid system; and
 - a brake for increasing the time period that the biasing mechanism closes the valve stem by an amount that eliminates water hammer in the fluid system.

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(Emphasis Added). As can be seen, claim 1 recites a water valve that is adapted to be coupled to a fluid system. Hajny et al. do not appear to disclose a water valve that is adapted to be coupled to a fluid system. Rather, Hajny et al. appear to relate to an air damper for use in duct work of an HVAC system (see, for example, Hajny et al., column 1, lines 37-46). Hajny et al. also do not appear to disclose a biasing mechanism that is adapted to close the valve stem within a time period that would cause water hammer in the fluid system, or a brake for increasing the time period that the biasing mechanism closes the valve stem by an amount that eliminates water hammer in the fluid system. In view of the foregoing, claim 1, as amended, is believed to be clearly patentable over Hajny et al. For similar and other reasons, dependent claims 2-8 and 33-34 are also believed to be clearly patentable over Hajny et al.

Dependent claim 33 further recites that the brake increases the time period that the biasing mechanism closes the valve stem to 4 seconds or more. Such an extended time period would be desirable to reduce or eliminate water hammer in a fluid system, but would appear to be very long for an air damper application. In any event, Hajny et al. do not appear to disclose such an element. Thus, for these additional and other reasons, dependent claim 33 is believed to be clearly patentable over Hajny et al.

Dependent claim 34 further recites that the brake is adapted to limit a rotational velocity of the motor only after the rotational velocity of the motor exceeds a threshold speed, wherein the threshold speed is 900 RPMs or less. Again, Hajny et al. do not appear to disclose such an element. Thus, for these additional and other reasons, dependent claim 34 is believed to be clearly patentable over Hajny et al.

Turning now to independent claim 9, which recites:

9. (Currently Amended) An actuator assembly configured for securement to a water valve having a valve with a valve stem, the actuator assembly comprising:
- a gear assembly configured to engage the valve stem;
 - a motor having an output shaft that is configured to drive the gear assembly in a first direction; and
 - biasing structure configured to drive the gear assembly in a second direction;

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a brake for reducing or limiting rotational velocity of the output shaft of the motor when the biasing structure is driving the gear assembly in the second direction, the brake is configured to limit the rotational velocity of the output shaft of the motor to less than 1000 RPMs.

(Emphasis Added). As detailed above, Hajny et al. do not appear to teach or suggest a water valve, as recited in claim 9. Rather, Hajny et al. appear to relate to an air damper for use in duct work of an HVAC system (see, for example, Hajny et al., column 1, lines 37-46). In addition, Hajny et al. do not appear to teach or suggest a brake that is configured to limit the rotational velocity of the output shaft of the motor to less than 1000 RPMs, as recited in claim 9. For these and other reasons, claim 9 is believed to be clearly patentable over Hajny et al. For similar and other reasons, dependent claims 10-20 are also believed to be clearly patentable over Hajny et al.

In paragraph 3 of the Office Action, the Examiner rejected claims 1, 2 and 4 under 35 U.S.C. §102(b) as anticipated by Weiss et al. (U.S. Patent No. 6,097,123). Claim 1 recites:

1. (Currently Amended) An actuator configured to actuate a water valve having a valve with a valve stem, the water valve adapted to be coupled to a fluid system, the actuator assembly comprising:

a motor configured to drive the valve stem in a first opening direction;

a biasing mechanism for driving the valve stem a second closing direction that is opposite to the first opening direction, wherein the biasing mechanism is adapted to close the valve stem within a time period that would cause water hammer in the fluid system; and

a brake for increasing the time period that the biasing mechanism closes the valve stem by an amount that eliminates water hammer in the fluid system.

(Emphasis Added). As can be seen, claim 1 recites a water valve that is adapted to be coupled to a fluid system. Applicant respectfully traverses this rejection. Like Hajny et al., Weiss et al. do not appear to teach or suggest a biasing mechanism that is adapted to close the valve stem within a time period that would cause water hammer in the fluid system, and a brake for increasing the time period that the biasing mechanism closes the valve stem by an amount that eliminates water hammer in the fluid system. For these and other reasons, claim 1, as amended, is believed to be

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clearly patentable over Weiss et al. For similar and other reasons, dependent claims 2-8 and 33-34 are also believed to be clearly patentable over Weiss et al.

In paragraph 4 of the Office Action, the Examiner rejected claims 1, 2, 6, 7, 9, 12-14 and 21 under 35 U.S.C. §102(b) as anticipated by Pasch et al. (U.S. Patent No. 6,021,955). Applicant respectfully traverses this rejection. Like Hajny et al. and Weiss et al. discussed above, Pasch et al. do not appear to disclose a water valve that is adapted to be coupled to a fluid system. Rather, Pasch et al. appear to relate to an air damper. In addition, Pasch et al. do not appear to teach or suggest a biasing mechanism that is adapted to close the valve stem within a time period that would cause water hammer in the fluid system, and a brake for increasing the time period that the biasing mechanism closes the valve stem by an amount that eliminates water hammer in the fluid system. For these and other reasons, claim 1, as amended, is believed to be clearly patentable over Pasch et al. For similar and other reasons, dependent claims 2-8 and 33-34 are also believed to be clearly patentable over Pasch et al.

Turning now to independent claim 9, which recites:

9. (Currently Amended) An actuator assembly configured for securement to a water valve having a valve with a valve stem, the actuator assembly comprising:
- a gear assembly configured to engage the valve stem;
 - a motor having an output shaft that is configured to drive the gear assembly in a first direction; and
 - biasing structure configured to drive the gear assembly in a second direction;
 - a brake for reducing or limiting rotational velocity of the output shaft of the motor when the biasing structure is driving the gear assembly in the second direction, the brake is configured to limit the rotational velocity of the output shaft of the motor to less than 1000 RPMs.

(Emphasis Added). As detailed above, Pasch et al. do not appear to relate to a water valve, as recited in claim 9. Rather, Pasch et al. appear to relate to an air damper. In addition, Pasch et al. do not appear to teach or suggest a brake that is configured to limit the rotational velocity of the output shaft of the motor to less than 1000 RPMs, as claimed. For these and other reasons, claim

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9 is believed to be clearly patentable over Pasch et al. For similar and other reasons, dependent claims 10-20 are also believed to be clearly patentable over Pasch et al.

Turning now to independent claim 21, which recites:

21. (Currently Amended) A valve assembly, comprising:
a valve having an open position and a closed position;
an actuator assembly coupled to the valve, the actuator assembly configured to move the valve between the open position and the closed position;
wherein the actuator assembly comprises a damping mechanism configured to limit a speed of the valve when the actuator assembly is moving the valve from the open position to the closed position such that the valve moves from the open position to the closed position in 4 seconds or more, but does not significantly limit the speed when the actuator assembly is moving the valve from the closed position to the open position.

As can be seen, claim 21 recites a dampening mechanism that is configured to limit a speed of the valve when the actuator assembly is moving the valve from the open position to the closed position such that the valve moves from the open position to the closed position in 4 seconds or more. Such an extended time period would be desirable to reduce or eliminate water hammer in a fluid system, but would appear to be very long for an air damper application. In any event, Pasch et al. do not appear to disclose such an element. Thus, for these and other reasons, claim 21 is believed to be clearly patentable over Pasch et al.

In paragraph 5 of the Office Action, the Examiner rejected claims 1-3, 8-11, 14, 15, 17, 21-25 and 27-30 under 35 U.S.C. §102(b) as anticipated by Persons (U.S. Patent No. 2,052,987). Applicant respectfully traverses this rejection. Claim 1 recites:

1. (Currently Amended) An actuator configured to actuate a water valve having a valve with a valve stem, the water valve adapted to be coupled to a fluid system, the actuator assembly comprising:
a motor configured to drive the valve stem in a first opening direction;
a biasing mechanism for driving the valve stem a second closing direction that is opposite to the first opening direction, wherein the biasing mechanism is adapted to close the valve stem within a time period that would cause water hammer in the fluid system; and
a brake for increasing the time period that the biasing mechanism closes the valve stem by an amount that eliminates water hammer in the fluid system.

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(Emphasis Added). Persons appears to describe an electric valve control that is configured to prevent a valve from rebounding when closed. Persons appears to be, at best, silent as to water hammer. Moreover, Persons do not appear to disclose a biasing mechanism that is adapted to close the valve stem within a time period that would cause water hammer in the fluid system, and a brake for increasing the time period that the biasing mechanism closes the valve stem by an amount that eliminates water hammer in the fluid system. In view of the foregoing, claim 1, as amended, is believed to be clearly patentable over Persons. For similar and other reasons, dependent claims 2-8 and 33-34 are also believed to be clearly patentable over Persons.

Turning now to independent claim 9, which recites:

9. (Currently Amended) An actuator assembly configured for securement to a water valve having a valve with a valve stem, the actuator assembly comprising:
- a gear assembly configured to engage the valve stem;
 - a motor having an output shaft that is configured to drive the gear assembly in a first direction; and
 - biasing structure configured to drive the gear assembly in a second direction;
 - a brake for reducing or limiting rotational velocity of the output shaft of the motor when the biasing structure is driving the gear assembly in the second direction, the brake is configured to limit the rotational velocity of the output shaft of the motor to less than 1000 RPMs.

(Emphasis Added). Persons do not appear to teach or suggest a brake that is configured to limit the rotational velocity of the output shaft of the motor to less than 1000 RPMs, as claimed. For these and other reasons, claim 9 is believed to be clearly patentable over Persons. For similar and other reasons, dependent claims 10-20 are also believed to be clearly patentable over Persons.

Turning now to independent claim 21, which recites:

21. (Currently Amended) A valve assembly, comprising:
- a valve having an open position and a closed position;
 - an actuator assembly coupled to the valve, the actuator assembly configured to move the valve between the open position and the closed position;

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wherein the actuator assembly comprises a damping mechanism configured to limit a speed of the valve when the actuator assembly is moving the valve from the open position to the closed position such that the valve moves from the open position to the closed position in 4 seconds or more, but does not significantly limit the speed when the actuator assembly is moving the valve from the closed position to the open position.

As can be seen, claim 21 recites a dampening mechanism that is configured to limit a speed of the valve when the actuator assembly is moving the valve from the open position to the closed position such that the valve moves from the open position to the closed position in 4 seconds or more. Persons do not appear to disclose such an element. Thus, for these and other reasons, claim 21 is believed to be clearly patentable over Persons. For similar and other reasons, dependent claims 22-26 are also believed to be clearly patentable over Persons.

Now turning to independent claim 27, which recites:

27. (Currently Amended) A valve assembly, comprising:
a valve having an open position and a closed position;
a valve stem operatively attached to the valve;
a gear assembly configured to engage the valve stem;
a motor configured to drive the gear assembly to the open position; and
one or more springs configured to drive the gear assembly to the closed position;

wherein the motor comprises a damping mechanism for limiting rotational velocity of the motor when the one or more springs are driving the gear assembly to the closed position, wherein the damping mechanism is configured to limit the rotational velocity of the motor only after the rotational velocity of the motor exceeds a threshold speed, wherein the threshold speed is 1000 RPMs or less.

For similar reasons to those discussed above with respect to claim 9, as well as other reasons, claim 27 is believed to be clearly patentable over Persons. For similar and other reasons, dependent claim 28 is also believed to be clearly patentable over Persons.

Now turning to independent claim 29, which recites:

29. (Currently Amended) A method of reducing water hammer caused by operation of a valve, the method comprising the steps of:
driving the valve to a first position corresponding to an open position at a first speed using a first force;

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driving the valve to a second position corresponding to a closed position at a second speed using a second force; and
reducing the second speed by providing a force that counters the second force;
wherein the valve moves from the open position to the closed position in 4 seconds or more.

Claim 29 recites a method for reducing water hammer caused by operation of a valve. As noted above, Persons appears to describe an electric valve control that is configured to prevent a valve from rebouncing when closed and is, at best, silent as to water hammer. In addition, claim 29 recites that the valve moves from the open position to the closed position in 4 seconds or more. As noted above with respect to claim 21, Persons do not appear to disclose such an element. Thus, for these and other reasons, claim 29 is believed to be clearly patentable over Persons. For similar and other reasons, dependent claim 30 is also believed to be clearly patentable over Persons.

Rejections under 35 U.S.C. § 103(a)

In paragraph 7 of the Office Action, the Examiner rejected claim 5 under 35 U.S.C. §103(a) as unpatentable over Hajny et al. (U.S. Patent No. 5,295,562) in view of Bellinger (U.S. Patent No. 6,349,253). Applicant respectfully disagrees. Bellinger appears to be directed towards a vehicle braking system. It is unclear how a vehicle braking system is related to the air damper of Hajny et al. Thus, there would appear to be little motivation to combine Hajny et al. and Bellinger in the manner suggested by the Examiner. In addition, and as detailed above, claim 1, from which claim 5 depends, is clearly distinguished from Hajny et al., and Bellinger does not appear to teach what Hajny et al. lacks. Thus, for similar and other reasons, dependent claim 5 is believed to be clearly patentable over Hajny et al. in view of Bellinger.

In paragraph 8 of the Office Action, the Examiner rejected claims 18-20 under 35 U.S.C. §103(a) as unpatentable over Hajny et al. (U.S. Patent No. 5,295,562) in view of Persons (U.S. Patent No. 2,052,987). Applicant respectfully traverses this rejection. As detailed above, claim 9, from which claims 18-20 depend, is clearly distinguished from Hajny et al., and Persons does

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not appear to teach what Hajny et al. lacks. Thus, for these and other reasons, dependent claims 18-20 are believed to be clearly patentable over Hajny et al. in view of Persons.

In paragraph 9 of the Office Action, the Examiner rejected claim 26 under 35 U.S.C. §103(a) as unpatentable over Persons (U.S. Patent No. 2,052,987) in view of Pasch et al. (U.S. Patent No. 6,021,955). Applicant respectfully traverses this rejection. As detailed above, claim 21, from which claim 26 depends, is clearly distinguished from Persons, and Pasch et al. does not appear to teach what Persons lacks. Thus, for these and other reasons, dependent claim 26 is believed to be clearly patentable over Persons in view of Pasch et al.

In paragraph 10 of the Office Action, the Examiner rejected claims 31 and 32 under 35 U.S.C. §103(a) as unpatentable over Persons (U.S. Patent No. 2,052,987). The Examiner asserts that the claimed methods are nothing more than what a trained mechanic does. Applicant must respectfully disagree.

Claim 31 recites:

31. (Currently Amended) A method of reducing water hammer in a fluid system caused by a previously installed water valve assembly that includes a valve and an actuator assembly, the actuator assembly including a first motor adapted to move the valve from a first position to a second position, and a return mechanism that is configured to return the valve to the first position at a return speed; the method comprising steps of:

removing the actuator assembly; and

installing a replacement actuator assembly that includes a second motor that includes a motor housing having an inside surface and a brake disposed in the motor housing, the brake being configured to engage at least part of the inside surface of the motor housing to slow the return speed of the second motor such water hammer is eliminated in the fluid system.

(Emphasis Added). As can be seen, claim 31 recites installing a replacement actuator assembly that includes a second motor that includes a motor housing having an inside surface and a brake disposed in the motor housing, the brake being configured to engage at least part of the inside surface of the motor housing to slow the return speed of the second motor such water hammer is eliminated in the fluid system. As detailed above, Persons appears to describe an electric valve

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control that is configured to prevent a valve from rebouncing when closed, and is, at best, silent with respect to water hammer.

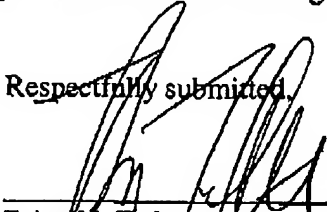
In addition, Persons does not appear to describe a motor that can be easily replaced with a second motor that includes a brake, and in particular, a brake that is disposed in the motor housing and configured to engage at least part of the inside surface of the motor housing. Instead, Persons appears to describe a shaft (34) that extends outwardly from motor (36) and into a drum (41). An S-shaped spring (42) bearing friction blocks (40) is mounted on the shaft (34), within the drum (41). Thus, Persons does not appear to describe a brake that is disposed in the motor housing or "that is configured to engage at least part of the inside surface of the motor housing", as recited in claim 31.

Moreover, Persons does not appear to describe or suggest an actuator that lends itself to easy motor replacement. Simply replacing Persons' motor, as suggested by the Examiner, would not provide or result in the recited brake, as Persons describes a motor that relies upon a separate brake (e.g. Drum 41). For these and other reasons, claim 31 is believed to be clearly patentable over Persons. For similar and other reasons, independent claim 32 is also believe to be clearly patentable over Persons.

Reconsideration and reexamination are respectfully requested. It is submitted that, in light of the above remarks, all pending claims 1-34 are now in condition for allowance. If a telephone interview would be of assistance, please contact the undersigned attorney at 612-359-9348.

Respectfully submitted,

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